

CLAIMS

We claim:

1. A computer implemented method for producing a data domain for a data
5 structure element of a computer program, the method comprising:
receiving domain configuration information corresponding to the data structure
element;
receiving a reflection of the computer program; and
producing the data domain based on the domain configuration information and
10 the program reflection.
2. One or more computer readable media having computer executable
instructions for performing the method of claim 1.
- 15 3. The method of claim 1, wherein the reflection of the computer program
comprises a listing of data structure elements of the computer program.
4. The method of claim 1 further comprising annotating code of the
computer program with the domain configuration information.
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5. The method of claim 4, further comprising compiling the code of the
computer program annotated with the domain configuration information for producing
the data domain according to its domain configuration information.
- 25 6. One or more computer readable media having computer executable
instructions for performing the method of claim 5.
7. The method of claim 1, wherein the domain configuration information
comprises one or more expressions for explicitly denoting the data domain to be
30 produced corresponding in form to one that is applicable to the data structure element.

8. The method of claim 7, wherein the expressions comprise methods and functions defined within the code of the computer program, which are exposed via the reflection of the computer program.

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9. The method of claim 7, wherein the data structure element is a data type with one or more fields and the form of the explicitly expressed data domain is a set of values of the fields comprising the data type.

10 10. The method of claim 7, wherein the data structure element is a method and the form of the explicitly expressed data domain is a set of tuples of parameters of the method.

11. The method of claim 7, wherein the data structure element is a field or a
15 parameter of a designated type and the form of the explicitly expressed data domain is an enumeration of values of the designated type corresponding to the field or the parameter.

12. The method of claim 1, wherein the domain configuration information
20 comprises information related to inheriting the data domain to be produced from the data domain of other related data structure elements.

13. The method of 12, wherein the data structure element is a data type
comprising a plurality of sub-types and the domain configuration information comprises
25 a selection of one or more of the plurality of sub-types wherein the data domain to be produced for the data type is a union of data domains of the sub-types belonging to the selection.

14. The method of claim 12, wherein the data structure element is a field or a
30 parameter of a designated type and the domain configuration information comprises

information indicating that the data domain to be produced for the field or the parameter is inherited from the data domain of their designated type.

15. The method of claim 1, wherein the domain configuration information
5 comprises information related to producing the data domain for the data structure element by applying domain generation techniques on other selected data domains.

16. The method of claim 15, further comprising filtering the result of the
applying domain generation technique step using a predicate.

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17. The method of claim 15, wherein the data structure element is a data type with a plurality of fields and the other data domains are data domains of the fields.

18. The method of claim 15, wherein the data structure element is a method
15 and the other data domains are data domains of the parameter.

19. A system for producing a data domain for a data structure element of a computer program, the system comprising:

20 a domain configuration manager for receiving domain configuration information corresponding to the data structure element and using a reflection of the computer program to produce the data domain for the data structure element according to the domain configuration information.

25 20. The system of claim 19, further comprising a graphical user interface communicative with the domain configuration manager for receiving the domain configuration information and transferring the domain configuration information to the domain configuration manager.

21. The system of claim 19, wherein the domain configuration manager comprises a graphical user interface for receiving user input related to the domain configuration information.

5 22. The system of claim 19, wherein the domain configuration manager is operable for reading the reflection of the computer program to identify the data structure element for its domain configuration.

10 23. The system of claim 19, wherein the data structure element is a data type and the domain configuration manager is operable for producing the data domain for the data type according to an explicit expression indicative of the data domain of the data type.

15 24. The system of claim 23, wherein the explicit expression comprises methods and functions defined within the computer program and exposed to the domain configuration manager via the reflection of the computer program.

20 25. The system of claim 19, wherein the data structure element is a method and the domain configuration manager is operable for producing the data domain as a set of tuples of parameters of the method according to an explicit expression of the domain configuration information.

25 26. The system of claim 19, wherein the data structure element is a field or a parameter of a declared type and the data configuration manager is operable for producing the data domain according to an explicit expression whose result is an enumeration of values of the declared type.

27. The system of claim 19, wherein the data structure element is a data type with sub-types and the data configuration manager is operable for producing the data

domain for the data type through inheritance as a union of data domains of its selected sub-types.

28. The system of claim 19, wherein the data structure element is a data type
5 and the data configuration manager is operable for producing the data domain for the data type by applying a domain generation technique to one or more fields of the data type.

29. The system of claim 28, wherein the domain generation technique is a
10 Cartesian product of the selected fields of the data type and the domain configuration manager is further operable for applying a constraint specified in the domain configuration information to the Cartesian product for producing the data domain for the data type.

15 30. The system of claim 19, wherein the data structure element is a field or a parameter of a declared type and the domain configuration manager is operable for producing the data domain for the field or the parameter as the data domain of their respective declared type through inheritance.

20 31. The system of claim 19, wherein the data structure element is a method and the domain configuration manager is operable for producing the data domain for the method by applying a domain generation technique to the parameters of the method.

25 32. The system of claim 31, wherein the domain configuration technique is a Cartesian product of the data domains of the parameters of the method and the data configuration manager is further operable for applying a constraint to the result of the Cartesian product for producing the data domain for the data type.

30 33. A system for producing data domains of data structure elements of a computer program, the system comprising:

means for receiving domain configuration information corresponding to the data structure elements;

means for reading a reflection of the computer program; and

- means for processing the domain configuration information and the reflection to
- 5 produce the data domains corresponding to the data structure elements.